ABSTRACT

THESIS: Personalized Smart Residency with Human Activity Recognition

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This thesis proposes developing a smart sensor-based system that recognizes persons entering any room in a house and identifies them. After that, the system adjusts the temperature automatically based on the identified persons and their preferences in the past. The proposed system will be distributed, which means controlling the temperature of each room is independently performed by controlling the vent/s in each room individually. The tasks of person recognition, activity recognition and preference learning will be enabled by machine learning algorithms.

This paper focuses on the smart recognition system and presents the complete identification process. Our proposed smart heating ventilating and air conditioning system has a major task which is identifying persons. This task is completed by designing a hardware platform that contains the sensors of the recognition system and developing a recognition software that performs several steps on the inputs gathered from sensors by applying linear regression, elbow method and k-means algorithm for the training stage and k-nearest neighbor algorithm for the prediction stage. The experiment that I completed shows that our recognition system can achieve high accuracy.